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## Diagenesis of the Upper Khuff (Permo-Triassic) Formation and Its Impact on Reservoir Characterisation

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The Upper khuff carbonate reservoir (Permo-Triassic) is a complex carbonate system with various fine-scale heterogeneities which have a direct impact on the reservoir quality distribution and dynamic behaviour. The porosity distribution and the permeability architecture of the Khuff reservoirs are the result of a complex interplay between depositional controls (facies, texture) and diagenetic overprints which have had both favourable and unfavourable impacts on reservoir quality.

The complexity of the Khuff poroperm network results from a series of diagenetic overprinting events including: (1) dissolution, (2) calcite cementation, (3) pore-filling and replacive anhydrite and (4) dolomitisation. Understanding the diagenetic evolution is, consequently fundamental in better understanding the reservoir heterogeneity and constraining the 3D distribution of Rock-Types.

This paper presents the results obtained from the petrographic and geochemical characterisation of the Khuff diagenetic products, their stratigraphic distribution and their reservoir impacts. The diagenetic interpretation has allowed the construction of conceptual diagenetic models to guide reservoir quality prediction. A particular emphasis has been placed on characterizing the dolomitization processes because each type of dolomite is formed in a specific diagenetic environment leading to different body geometries and distribution. As some of these dolomites present distinctive reservoir properties (good porosity and very high permeability values), it is essential to evaluate and map the geometry and the extent of the different dolomite bodies to be able to predict the dynamic behaviour of the field.

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